**IT Applications, Unit 4**

**Ch 6, Developing a solution using spreadsheet software, p 192-213**

Case Study: Point Pleasant Social Service Program – organisational outline and current practice

**Designing spreadsheet solutions and output**

1. Describe what is involved in the solution design stage.

Once the analysis stage is complete and a general idea of the solution is in mind, it is time for the design stage. Designing a solution often occurs without using a computer at all – the solution may just be drafted on paper.

**Spreadsheet Design Tools**

Elaborate under each of the following design tools:

1. IPO chart

An IPO chart is used during the design process to clearly identify the solutions input, output and the processing steps required to transform the data into information.

1. Flow chart, (list what each of the symbols mean from fig. 5-10.

The use of flowcharts in the design of a solution is described in chapter 5. You will recall that a flowchart is used to graphically represent, in a logical order, the steps required to create a solution or a procedure to use the solution.

1. Formula list

A formula list is similar to a data dictionary and shows a detailed list of the formulas to be used to achieve each bit of output identified in the IPO chart.

1. Structure chart

A structure chart is a graphic representation of how the spreadsheet solution might work. Typically, a solution will be made up of more than one sheet in a workbook file, the structure chart shows how each of these worksheets relate to each other.

1. Layout diagrams

A layout diagram shows the basic layout of each type of worksheet in the spreadsheet solution. The layout diagram should clearly indicate:

* The type of data to be entered into the cells in the spreadsheet
* An indication of the contents of each cell
* Labels, which will aid in the entry of data into the correct cell
* Any validation rules that need to be entered into the spreadsheet, with the error messages to be used
* **Formats and conventions** that are used when manipulating spreadsheet data
* heading, subheading and instructions.

**Formats and conventions, p 202-**

1. list under each of the following subheadings the major formats and conventions that apply to spreadsheets:
   1. numerical information

* numbers are naturally right-aligned in columns; this is important for validation.
* Money values usually have two decimal places or none.
* Align decimal points by using a consistent number of decimal places
* Percentages in columns appear with the percentage symbol at the top of the columns rather than with the data.
* Subtotals have a single line above the total
* Grand totals have a single or double line below the total
* Grand totals are in bold.
* Symbols indicating the unit of measure, such as %, $, kg, cm, usually appear in the column heading rather than next to each value.
* Use named ranges of cells to make formulas easier to understand.
  1. financial reports
* use a space or a comma to separate numbers greater than 999; for example, 1,999.
* Use italics to indicate addition or subtraction.
* Subtotals have a single line above the totals
* Include $ sign in column headings rather than next to each money value.
* Right-align dates to allow for double figures.
  1. charts and graphs

Ensure you choose the correct chart for the type of information you wish to convey.

* Graphs and charts mush have titles identifying the name of the organisation and the purpose of the graph or chart.
* The x-axis and the y-axis must be labelled.
* Use a key if more than one set of data is provided on the same graph or chart.
* Include author identification and/or source of data, date and a filename (if appropriate).
* Include the unit of measure on the relevant axis.
* Label each segment of a pie chart.
* Arrange segments of pie chart (starting at 12 o’clock) from largest to smallest.
* Include absolute figures as well as percentages.
* Choose colours that match the information being discussed.
* Use bar charts to show the differences between values or to show changes over a period of time.
* Use pie charts to compare parts of a whole of relationships between segments.
* Use graphs to show trends or relationships between values on each axis.
* If more than one line is used in a line graph, vary the thickness or line type of each one.
* Limit the number of items represented in a chart to five or six.

1. Describe the file naming conventions for spreadsheets.

The filename of a spreadsheet ought to indicate its purpose and any time period it covers. Each worksheet must also be given a short but meaningful name.

**Designing a macro**

1. What is a macro?

A macro is an automated series of tasks.

**Validation**

1. Describe each of the following types of validation used in a spreadsheet:
   1. Range checking

Range checking involves checking to ensure that data falls within a certain ‘range’.

* 1. Existence checking

If your spreadsheet is dealing with product codes, a LOOKUP ( ) formula can be used to check the existence of a code in another worksheet table.

* 1. Data type checking

Data type checking can be used if the data needs to be of a particular type.

* 1. Restricted data entry

The best way to ensure that data entered is valid, is to restrict data entry.

* 1. Validation alerts

As part of the data entry process, electronic data validation methods need to alert the user that the data being entered does not adhere to the validation rules.

**Planning to test a spreadsheet solution**

1. What is the difference between validation and testing?

Validation is involved with input whilst testing is concerned with the solution itself and out. Testing can, however, also involve ensuring that electronic validation works correctly.

1. When is the test plan or test table created?

In the design stage you need to plan out the testing that you will conduct after the development stage. Therefore, after the designs for the actual solution have been created, we make the test plan or test table.

1. Attributes or properties to a spreadsheet solution that need to be tested; elaborate under each of the following testing types:
   1. Functionality testing

The functionality of a system relates to the activities or actions that it was designed to carry out. When testing functionality, it is important to look at the original problem and determine if the solution meets the organisation’s needs.

* 1. Presentation testing

During the design phase of the problem-solving methodology, a decision must be made on the appropriate format of the solution; for example, how a solution should be communicated – as a report, chart or a list of results.

* 1. Usability testing

All spreadsheets, whether they are simple worksheets or complicated solutions with macros, need to be user-friendly. The information being conveyed should be easily accessible to the users.

* 1. Accessibility testing

A spread solution needs to be easily accessible, consider testing for the following:

* Does the solution open up at the right worksheet?
* Are font sizes easy to read?
* Is there limited use of red and green colours on the spreadsheet for people who are colour blind?
  1. Communication of message

The important information presented in the solution, whatever the format, should be clear and obvious. An advertisement on a brochure, poster or website that intends to advise the date, time and venue for a meeting must convey those details without the readers getting lost among other less vital information.

**Evaluating the solution and output**

1. What does evaluation consider?

Evaluation considers the efficiency and the effectiveness of the solution. It usually takes place after the solution has been implemented for a period of time, often between 3 and 6 months.

1. What information needs to be gathered?

Information needs to be gathered from a variety of users to determine whether the solution is meeting the system’s goals.

1. Who is best to undertake the evaluation?

The evaluation is usually best completed by someone other than the developer, so that the solution is more likely to be viewed impartially.

1. When are the evaluation criteria developed?

The evaluation criteria are developed in the design stage of the problem-solving methodology so that the system designers know which features to include.